

## AEROLOGICAL OBSERVATIONS

[Aerological Division, D. M. LITTLE in charge]

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NOTE.—The text and tables for this section will be published in a later issue of the REVIEW.—*Ed.*

## RIVERS AND FLOODS

[River and Flood Division, MERRILL BERNARD in Charge]

By THOMAS S. SOUTHWICK

Rainfall during June was generally above normal in the eastern part of the country except for the Northeast. Rainfall was much less abundant in July, above normal rainfall occurring only in the Ohio Valley region, portions of the south Atlantic coast and the Far West. In the Northeast, rainfall was very scanty and streams in New England were at quite low stages.

Floods were not numerous nor especially severe except for an extraordinary "flash" flood in Kentucky early in July. The floods during June and July were generally the result of locally intense rainstorms characteristic of summer. Flood stages were usually of short duration and of local extent except in the low lying rivers of the lower Mississippi basin.

Detailed damage figures are given in a table at the end of this article.

*Atlantic Slope drainage.*—Locally heavy rains occurred over the South Atlantic States from July 19 to 22 in association with frontal activity. Streams were at fairly low stages and flood stage was exceeded only on the Cape Fear and Neuse Rivers. Flooding was slight with practically no damage.

*East Gulf of Mexico drainage.*—High stages continued to prevail on the Tombigbee River with flood stage being attained during the first week in June at some stations and throughout its length at various dates from June 16 to 28. These floods were the result of the rises of May occasioned by the heavy rains during the last 2 weeks of May, augmented by the rainfall from frequent and widely distributed thundershowers of June. Stages were moderate on the Tombigbee, although extreme stages were reported on some of the Northeastern tributaries. However, these floods, occurring as they did during the growing season, caused widespread damage, estimated at over 3 millions of dollars. Approximately 200,000 acres of land were inundated.

The Bogue Chitto and Pearl Rivers went above flood stage early in June. Stages and consequent damage were moderate.

*Mississippi System—Upper Mississippi Basin.*—A progression of lows across the basin from June 11 to 22 resulted in enough rainfall to raise the streams, but the only flood situation was in the lower Chippewa River. The river at Durand, Wis., was only slightly above flood stage on June 22 and 23, and only slight damage resulted from the flooding of basements.

In northeastern Missouri the passing of a low resulted in heavy and fairly widespread rains on the night of June 20–21. This rain caused a rapid rise in the Salt River which resulted in the flooding of considerable farm land and extensive damage to crops and other farm property.

The Salt River went slightly above flood stage on July 26 as the result of thunderstorm rains. There was nominal damage to prospective crops.

Heavy showers resulted in the Republican, Big Blue, and Grand Rivers going above floodstage during the

period June 22 to 28. Except for the lower reaches of the Grand River, the period above flood stage at each point was only 1 or 2 days. Stages were slight to moderate with little damage reported.

In July, local rains caused slight flooding at Chillicothe, Mo., on the Grand River on the 5th and at Beloit, Kans., on the Solomon River on the 27th. There was no damage.

*Ohio Basin.*—Cyclonic development over Ohio on June 18 caused heavy showers in the upper portions of the Scioto and Olentangy Rivers. The rainfall averaged between 4 and 5 inches, but the low stages prevailing at the time caused only minor flooding to take place. There was some damage to prospective crops.

A local, but devastating "flash" flood occurred in eastern Kentucky on July 5. Very heavy rains resulted from thunderstorms associated with a cold front. The towns of Farmers, Clearfield, Morehead, and Keck were inundated by the sudden overflow. There were 79 lives lost according to the American Red Cross. The flood occurred on small streams on which the Weather Bureau does not maintain river gages; hence no stages are listed. This disastrous flood is described by W. C. Devereaux, official in charge at the Cincinnati, Ohio Weather Bureau Office as follows:

Torrential rains, varying in amount from 2.5 inches to more than 9 inches, fell in a few hours over portions of eastern Kentucky during the night of July 4–5, 1939. The topography of this section of the State is mountainous. The mountain ranges extend in a northeast-southwest direction and are separated from each other by deep and narrow valleys. It is therefore not surprising that rainfalls of the proportions mentioned above, falling in from 2½ to 4 hours, should cause the normally placid creeks and small streams to become raging torrents causing destruction to life and property. The floods were nearly all confined to the creeks and small streams entering the upper Licking and upper Kentucky Rivers. The only river gaging station on the Licking River in this district to report flood conditions was at Farmers, Ky., where a crest of 25.25 feet was recorded at 10:06 a. m., on July 5th, 0.25 foot, above flood. At Jackson on the upper Kentucky River 3.75 inches of rain fell between 3:15 a. m. and 8 a. m. on July 5th. The crest stage of the river was 20.40 feet, at 6 p. m. on the 5th (flood stage 28 feet).

Heavy rainfall associated with a low that traversed Indiana on the night of July 17–18 resulted in one of the flashiest floods of record in the middle upper reaches of the Wabash River. Rainfall amounts, in a relatively small area centered over Covington, Ind., averaged 3 inches. The Wabash River at Covington rose 11.6 feet in 24 hours, but fortunately the local extent of the rain and the low summer stages then prevailing prevented other than minor flooding. Moderate damage was reported.

*White, Arkansas, and Red River Basins.*—The White River below Georgetown, Ark., was slightly above flood stage at the beginning of June from the rains of April and May. Moderate stages on the lower Mississippi River during the first half of May delayed run-off in the lower White River. This condition, augmented by normal rainfall during May and early June, maintained the river above flood stage for about 2 weeks. Little damage was reported.